REMARKS

Claims 1-11 and 16-18 now stand in the present application, claim 15 having been canceled and replaced with a new independent claim 18. Reconsideration and favorable action is respectfully requested in this case in view of the following amendments and remarks.

In the Office Action, the Examiner has rejected claim 15 under 35 U.S.C. § 112, second paragraph, as being indefinite for failing to particularly point out and distinctly claim the subject matter which Applicants regard as the invention. The Examiner specifically stated that claim 15 is unclear and confusing as to how the synthesis apparatus is arranged to perform the method of claim 1. As noted above, claim 15 has been canceled in favor of a new claim 18 which more clearly recites in means plus function format an apparatus practicing the method of claim 1. Accordingly, the Examiner's § 112, second paragraph rejection of the claim is believed to have been overcome.

The Examiner has also rejected claims 1-11 and 15 under 35 U.S.C. § 102(e) as being anticipated by Otsuka et al. or Nushiguchi et al. and has rejected claims 16 and 17 under 35 U.S.C. § 103(a) as being unpatentable over Otsuka et al. in view of Kleijn et al. Applicants respectfully traverse the Examiner's § 102 and § 103 rejections of the claims.

The Examiner is improperly interpreting the word "sample" broadly to include a set of sampled data representing an entire period of a waveform, which is a "sample" of a larger waveform. This is evidenced by his contention (at page 3, lines 6-7 of the

Office Action) that the "generation of a speech waveform" teaches the "generation of a cyclical sound waveform sample."

The word "sample" is well defined in the relevant technology and can be found, for example, in Communications Standard Dictionary, 2nd Edition, 1989, Martin H. Weik (ISBN 0-442-20556-2) on page 1005 (and therefore would be understood by a person of ordinary skill in the pertinent art) as "the value of a specific parameter (characteristic), such as the amplitude, frequency, phase or direction of a signal at a chosen instant." It can therefore not be interpreted in the way the Examiner has done so.

None of the passages cited by the Examiner (Abstract at column 2, lines 13-54, and 59-64) teach the generation of any waveform samples as is required by claim 1. Rather, they teach the generation of a speech waveform and pitch waveforms. The Examiner's rejection of claim 1 on the ground that it lacks novelty over Otsuka is therefore in error. Also, each of the other claims rejected by the Examiner is novel at least by virtue of its dependency on claim 1.

Some additional comments regarding these dependent claims are made below.

The passage of Otsuka et al. referred to by the Examiner in respect of claim 3 teaches the generation and linking together of pitch waveforms with shifted phases and a parameter that is acquired at a specific sampling frequency to generate pitch waveforms. It does not make any mention of any data that defines a transformation followed by cycles in the temporal vicinity of a cyclical sound waveform sample and as such cannot teach that feature of the claim. Accordingly, claim 3 is believed to further patentably define over the cited reference.

The subject matter of claim 5 is a multidimensional state space representation of

a signal in which successive pitch pulse cycles are superposed to estimate the progression of the signal within each cycle and from cycle to cycle. Therefore the passage in Otsuka et al. referred to by the Examiner, which teaches the generation of a pitch waveform from a synthesis parameter and a pitch scale, does not teach the features of claim 5. Accordingly, claim 5 is believed to further patentably define over the cited reference.

The passage in Otsuka et al. referred to by the Examiner in respect of claim 6 does not make any mention of any data that defines a transformation followed by cycles in the temporal vicinity of a cyclical sound waveform sample and as such cannot teach that feature of claim 6. Accordingly, claim 6 is believed to further patentably define over the cited reference.

The passage in Otsuka et al. referred to by the Examiner in respect of claim 10 teaches to set an internal register of a wavepoint number memory to 0, to initialize a parameter series counter to 0 and to fetch parameters for the 1^{th} and $(i+1)^{th}$ frames. It does not make any mention of a pseudo random number generation algorithm as is required by claim 10. Accordingly, claim 10 is believed to further patentably define over the cited reference.

The apparatus claimed in new claim 18 (which replaced claim 15) recites means for performing the method set forth in independent claim 1 and, therefore, has been proven to be novel for the arguments given above. Therefore the apparatus itself must be novel.

The Abstract of Nushiguchi et al. teaches that the harmonics of an original speech signal are arranged as sequential frames with possibly differing pitch periods.

Then data arrays containing amplitude and phase data of the harmonics are zero-padded to provide a pre-set number of elements and a transformation of the data arrays is carried out to produce time domain information which is subsequently used to generate a restored time domain waveform. It cannot be said, however, that a successive cyclical waveform sample is generated from a previously generated cyclical waveform sample and data defining a transformation followed by substantially similar cycles in the temporal vicinity of the previously generated cyclical waveform sample as is required by claim 1.

Furthermore, column 11, lines 1-10 of Nushiguchi et al. (as cited by the Examiner) describe repeatedly employing two waveforms in order to procure a length waveform L_p. The waveforms of the length L_p are then multiplied and the resulting windowed waveforms are added together to produce a spectral interpolated waveform. Using the same argument as found above (in paragraph 7) with regard to the word "sample", this passage cannot teach the step found in claim 1(e) of "outputting the samples of said sequence...". The Examiner's rejection of claim 1 on the ground that it lacks novelty over Nushiguchi et al. is therefore in error. Also, each of the other claims rejected by the examiner is novel at least by virtue of its dependency on claim 1.

Some additional comments regarding these dependent claims are made below.

The passage in Nushiguchi et al. referred to by the Examiner in respect of claim 3 does not make any mention of any data that defines a transformation followed by cycles in the temporal vicinity of a cyclical sound waveform sample and as such cannot teach that feature of claim 3. Accordingly, claim 3 is believed to further patentably define over the cited reference.

The passage in Nushiguchi et al. referred to by the Examiner in respect of claim 5 teaches the reproduction of a time domain waveform from one time point to another. It does not make any mention of generating a plurality of values representing waveform sample values as a point in multidimensional space as is required by claim 5. Accordingly, claim 5 is believed to further patentably define over the cited reference.

The passage in Nushiguchi et al. referred to by the Examiner in respect of claim 6 is all about reducing the volume of the processing operations for the decoding operation. It speaks of interpolation of amplitude and phase data of harmonics and summing together time domain waveforms. However, it makes no mention of displacement vectors extending from a time point on a reference waveform sequence to corresponding points on the waveform to be synthesized as is required by claim 6. Accordingly, claim 6 is believed to further patentably define over the cited reference.

The passage in Nushiguchi et al. referred to by the Examiner in respect of claims 7, 9 and 11 merely describes the problem associated with deeming sets of amplitudes to be spectral data and reverting them to time domain waveform data which is then further processed. It makes no mention of any of the features of claims 7, 9 and 11. Accordingly, claims 7, 9 and 11 are believed to further patentably define over the cited reference.

The passage in Nushiguchi et al. referred to by the Examiner in respect of claim 10 merely derives the number of sum-of-product calculations necessary for each frame in the conventional decoding method and states that the purpose of the invention subsequently described. It does not make any mention of pseudo random number generation algorithms as is required by claim 10. Accordingly, claim 10 is believed to

further patentably define over the cited reference.

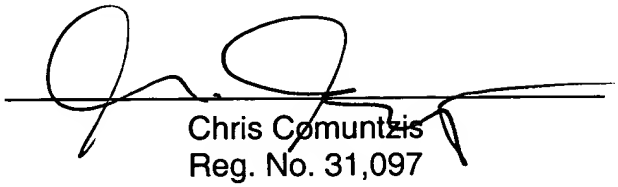
The apparatus now claimed in claim 18 recites means for performing the method set forth in independent claim 1 that has been proven to be novel using the above arguments. Therefore the apparatus itself must be novel.

In rejecting claims 16 and 17 over a combination of Otsuka et al. In view of Kleijn et al., the Examiner cites column 4, line 24 to column 5, line 4 of Otsuka et al. against claim 16. Nowhere in this passage does it mention n-dimensional state space representations of voiced speech signals referred to in the claim and also described on pages 4-6 of the PCT application as published. Hence the prior art does not teach all the claim limitations and therefore the Examiner has failed to establish a prima facie case of obviousness against claims 16 and 17.

Therefore, in view of the above amendments and remarks, it is respectfully requested that the application be reconsidered and that all of claims 1-11 and 16-18, now standing in the application, be allowed and that the case be passed to issue. If there are any other issues remaining which the Examiner believes could be resolved through either a supplemental response or an Examiner's amendment, the Examiner is respectfully requested to contact the undersigned at the local telephone exchange indicated below.

Respectfully submitted,

NIXON & VANDERHYE P.C.

By: 

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